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ABSTRACT

Carrying out argumentative discussion online has become rather common in higher education. This task is traditionally supported by asynchronous collaboration tools, but this paper suggests that also synchronous supports could be useful. This paper focuses on scaffolding the knowledge construction: the work of two student moderators jointly moderating a theme as part of a seminar type university level course. As a new scaffold, the paper describes a collaborative note-taking tool as an extension to a standard conferencing system. This new tool can be utilized either asynchronously or "semi-synchronously." An empirical evaluation of the first implementation of this tool is reported. There were almost 60 students on three courses who had an opportunity to use the tool. The evaluation shows that the students were not used to working together this way, although they recognized the benefits of joint moderating. Explanations are offered for these results and further plans in this area are discussed. (Author)

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Asynchronous conferencing with a twist of synchronicity: in search for tools for collaborative moderation in online discussions

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Abstract: Carrying out argumentative discussion online has become rather common in higher education. This task is traditionally supported by asynchronous collaboration tools, but we believe that also synchronous supports could be useful. In this paper we focus on scaffolding the knowledge construction: the work of two student moderators jointly moderating a theme as part of a seminar type university level course. As a new scaffold, we describe a collaborative note-taking tool as an extension to a standard conferencing system. This new tool can be utilized either asynchronously or "semi-synchronously". An empirical evaluation of our first implementation of this tool is reported. There were almost 60 students on three courses who had an opportunity to use the tool. The evaluation shows that our students were not used to working together this way, although they recognised the benefits for joint moderating. We offer some explanations for these results and discuss our further plans in this area.

Introduction

In higher education today, there is a tremendous worldwide pressure to produce online "E-courses" that would be available for both students on-campus and those off-campus, e.g. working simultaneously with their studies. Indeed, there are currently numerous efforts underway transferring existing courses online and creating new online ones. At the same time, there is a well-recognised need to learn how to work collaboratively. Because people seem to find less and less time for face-to-face meetings, collaboration should be an essential part in E-courses, too. A vast body of research shows, however, that online cooperation and collaboration is not easy.

One emerging issue is the fact that in a well-designed WWW-based learning environment there should not be just one dominant way of communication and collaboration, but several of them – for different learners and for different teachers (Collis & Moonen 2001). In this approach, however, there is a danger that there might be too many separate tools for the learner – the richness becomes an overload. In our opinion, for the best benefit, the learner should receive scaffolding and support in choosing these facilities, and they should be "close to the task" and available "just-in-time". We agree with Erkens *et al.* (2002): "The relationship between collaboration processes, task strategies and the use of the tools and resources that the computer environment offers, may be crucial for the effects of computer supported collaborative learning."

One of the most common tools in any online learning environment today is an asynchronous conferencing facility that allows the learners to participate and contribute free from specific lecture times and free from specific physical places of education institutions. However, learning in real-time together with your teacher and peer learners should not be forgotten.

We have been working with asynchronous conferencing systems (Hietala 1999, Hietala 2001) with the emphasis on collaboration of small groups and student pairs. We have noticed that, in some learning situations, a considerable amount of student work consists of collaborative writing and planning, which would benefit from working synchronously. One tool to support this might be a collaborative note-taking tool, inside the conferencing system, that could be used in "synchronous fashion".

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In this paper we report on an empirical evaluation of our first implementation of a tool of the above kind on three courses with 59 students. The students worked in pairs and the task to be scaffolded was a joint moderation where two moderators were required to moderate together an online discussion during four weeks' time. Besides normal conferencing facilities they were provided with a personal notebook within the conferencing system, which they could share with their moderator pair.

The evaluation shows that our students were not used to working together online this way, although they recognised the opportunities offered for joint collaborative writing and moderating ongoing discussion. We offer some explanations for these results and discuss also our further plans in this area.

Asynchronous vs. synchronous collaborative moderation

According to Mason (1998) there are several advantages to the asynchronous online learning, e.g.:

- flexibility - access to the computer conference discussions can take place at any time and from many locations,
- time to reflect - rather than having to react immediately, the learner is allowed to mull over ideas and prepare a comment, and
- situated learning - because the technology allows access from home and work, the learner can integrate the ideas being discussed on the course with the working environment.

On the other hand, Mason (1998) lists advantages to synchronous systems, too:

- motivation and pacing - synchronous systems focus the energy of the group, providing motivation to distance learners to keep up with their peers and continue with their studies,
- telepresence - real time interaction with its opportunity to convey tone and nuance helps to develop group cohesion and the sense of being part of a learning community, and
- good feedback - synchronous systems provide quick immediate feedback on ideas and support consensus and decision-making in-group activities.

In this paper we are interested in the task of moderating online conferences. Modern "integrated" environments, like e.g. WebCT, offer the course designer (teacher) an opportunity to include both asynchronous (bulletin boards, e-mail...) and synchronous (chats, IRCs...) discussion areas for their students. However, these are often used separately and seen as complementary. Intertwining of them is seldom suggested.

These two interaction modes seem to support different, albeit necessary working methods. Considering argumentative university-level discussions, for example, one study (Veerman *et al.* 1999) found out that in one synchronous system, students engaged into short and strong discussions. They checked, challenged and countered each other's information and produced additions and evaluations. On the other hand, in the same study, the asynchronous discussions with an asynchronous tool could be characterised as highly constructive, and students tended to argue 'mildly' by information checks and they mainly added or explained information.

However, are there situations or tasks, which would benefit from both of these two interaction types being available? We introduce collaborative moderation of online discussions as one such a task. The task we consider here is a pair of students jointly moderating a theme on a computer conferencing area. There are numerous guidelines for the moderating task (see e.g. Paulsen 1995, Muilenburg & Berge 2000), but interestingly, joint student moderation has been studied very little. A recent exception is the work by Rourke and Anderson (2002), where groups of four students were used to lead online discussion on course readings. In our work the student moderators worked in pairs, and also, they were able to utilize the content of their moderated discussion group later on when they prepared and presented their seminar paper on the very same topic they were earlier moderating.

We can distinguish several subtasks in the moderator's work: how to start the discussion (Phase I), how to keep the ongoing discussions alive (Phase II), and how to summarize and end the discussion (Phase III). We can envision several scenarios where collaboration is essential:

- In *Phase I*, the pair is required to prepare a joint statement on the topic at the beginning of the four-week discussion period. Bonk and his colleagues (Hara *et al.* 2000) have recommended and studied this kind of an instructional method, which emphasises the starting of the discussion process (starter-wrapper activity). Their analysis shows that student electronic comments in the discussions were

highly dependent on the directions of the discussion starter – the initial posting. In collaborative moderating the pair must build joint initial understanding of the topic and compose a thought-provoking initial statement for the discussion group. Although our pairs received material and guidelines concerning their task and they had time to familiarize with the topic, we assume that still much two-way communication would be required here.

- In *Phase II*, there is an obvious need for some kind of scheduling and deciding who will answer each question or comment on a specific issue raised by the discussants in the group. Good questions are essential as part of the starting contribution, but good follow-up questions are also needed to maintain the online discussion. Moreover, there is the crucial question when to bring in new material and links to boost a weaker-growing discussion? Furthermore, building a joint understanding requires a fair amount of communication between the moderators. We believe all this calls for either synchronous or "semi-synchronous" online meetings between the moderators.
- Finally in *Phase III*, wrapping up the findings and conclusions of the discussions is required. Clearly, writing a reflective summary of the contributions resulting from online discussions of several weeks in a discussion group calls rather naturally for joint planning (asynchronously and synchronously). In our seminar course, to motivate the pair, they were given the possibility to use this summary as part of their seminar paper for their standard face-to-face seminar presentation.

To sum up, we believe that, in a task like this, there is a need for a just-in-time facility for "synchronous" collaboration within an asynchronous system. Other tools could of course be used, e.g., e-mail, chat, telephone, face-to-face meetings, but we wanted to provide one tool in line with the actual authentic discussion task and conference area. We hypothesized that here e-mail might be too slow, and chat might be too cumbersome. Placing a new facility "very close" the actual work area – the commenting area – we believe this could yield many benefits for the learning process, e.g. in the opportunity for sustained preparation of joint statements (needed as part of the moderators' work).

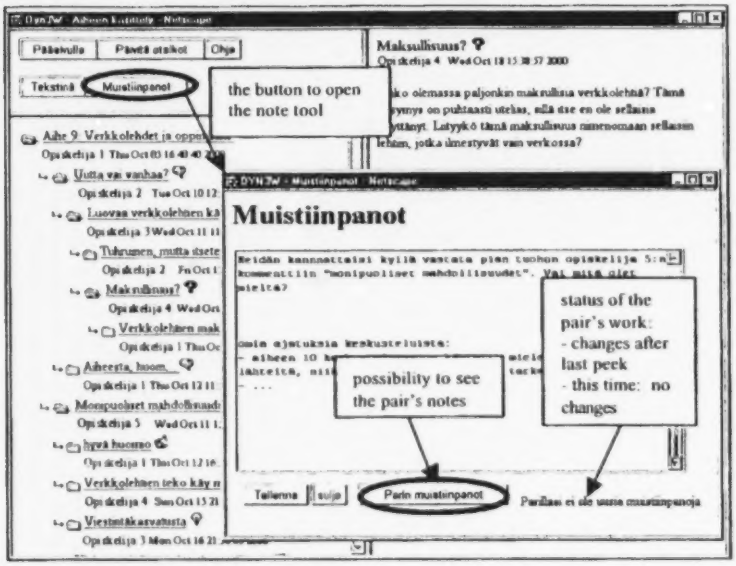
The Study

In this section we first outline the conferencing system within which we implemented the new tool and after that describe the use of this tool on our courses.

Collaborative note-taking tool

The CoWoGLe (Conferencing on the Web for Group Learning) project at the University of Tampere investigates the use of Web-based lightweight conferencing systems especially as part of university level course work. Earlier courses using our systems have been reported in Hietala (1999, 2001). Recently, some of our students raised the issue of the need for a note-taking tool inside our conferencing system. In considering this, we decided that the tool could also be a shared one, thus allowing the pairs to collaborate almost "in real-time".

The new note-taking tool was available for each of the students all the time he/she was using the conferencing forum. It was possible to copy onto it parts of the discussion entries of the others, write one's own ideas, edit them and save them for further use (giving extra time to reflect). We call this *Mode A* of utilizing the note tool. Besides helping to remember, to think, to clarify, we believe that the tool can help to share: either asynchronously, or semi-synchronously. We call these two ways, Mode B and C. In *Mode B*, the pairs would leave messages to their partner onto the note area, and see and answer to that at a time that would suit them best. In *Mode C*, the pairs would decide a time when they should both be present at a networked computer, and then exchange ideas and maybe reach decisions by adding them onto their personal note areas and letting their partner see that and respond to that ("semi-synchronously"). In our system this was supported by indicators of the notes made by the pair of the student: whether they had been changed after the last peek, and also a possibility to have a look at them (see Figure 1).


the button to open the note tool
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status of the pair's work:
- changes after last peek
- this time: no changes
possibility to see the pair's notes

Figure 1: The note-taking tool, with the possibility to collaborate and to see the notes of your pair.

The Courses

Next we describe our data from three undergraduate level courses where the students were given the opportunity to utilize the note-taking tool as part of producing their Web discussion and moderation postings. The course is titled "Internet based learning environments" (all students had earlier completed our basic course on Instructional Technology). There were a few lectures to start the course, followed by the work on the Net and finally traditional face-to-face seminar sessions. At the beginning of the course the students chose a seminar topic either provided by the teacher or suggested their own one. The seminar work was conducted in pairs, which were formed by the topic selection process. The "matching" of pairs was entirely carried out on the Web - we hoped that similar interests brought them together. Next, students conducted a four-weeks online moderating of the discussion in their topic after which they presented their seminar paper in a one-hour session before the entire class.

We ran three courses of the above format in Autumn 2001 and Winter 2002. On these three courses there were altogether 59 students: 34, 9 and 16 respectively. In the following, we call these three courses as follows: The Distributed Course, The Local Course, and The Open University Course. The Local and the Open University Course students (basically) came from Tampere area and could easily work in the same computer classrooms. The Local Group consisted mainly of regular Computer Science undergraduates, although there was also one student mastering in the English Language and one vocational level in-service teacher. The Open University Group was more heterogeneous, these students were older, worked daily and attended the course at evenings or weekends.

On the other hand, The Distributed Course was a little bit different. The lectures were the same but were given at these two different locations (Hämeenlinna and Tampere, 100 kilometers apart). The group of 34 students in this group consisted of 17 in-service teachers (from Hämeenlinna) and 17 university students (from Tampere). Each moderator pair consisted of one in-service teacher and one university student. The in-service teachers mainly taught at elementary level, although there were a few mathematics teachers at secondary level. The university students were mostly computer science majors, with 20 % of them majoring to become mathematics teachers.

Table 1 depicts the corresponding discussion activity in the three groups during the four-week online discussion period. Each participant was required to produce one posting in three conference topics during each week: one moderating comment in his/her "own" topic (the one he/she would make the seminar presentation) and two in two topics that he/she had committed him/herself as a commentator. These kinds of requirements are

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common in order to ensure equal participation and even distribution of comments on discussions lasting for many weeks. So the minimum number of comments in our courses for each participant was 12. As we can see in Table 1, most students contributed more.

We can see from the Table 1 that the Open University students were most active and produced most postings onto the discussion areas, while the Local and Distributed Groups were almost the equal with this respect. As moderators, the Distributed Group was clearly behind the others.

	Distributed	Local	Open Univ
Number of students	34	9	16
Total number of comments	710	187	370
Average number of comments/student	20,88	20,78	23,13
Average number of comments as a moderator	6,21	8,56	8,5

Table 1. The amount of Web discussion on the three courses

Results

Our main interest in this paper is the use of the note-taking tool. We wanted to find out how the students acted in the three phases and three modes we outlined earlier. During the lecture part of the courses, the conferencing system was briefly introduced (as well as the new facility for note-taking). Students were also given a paper leaflet describing the conferencing tool.

We collected data mainly in two ways: logging the actual use of the tool, and posing a questionnaire at the end of the course. Let us first have a look at the log data. In Table 2 we have counted the use of the different functionalities present in the Note-taking Tool window (cf. Figure 1): opening and closing the tool, saving the contents of the tool, and looking at the notes of one's pair. The first three actions above give indications if the students actually made use of the tool and the fourth tells us whether the tool was used for collaboration. The student has to save his/her notes on the tool area, before his/her pair has a chance to see that there has been a change in the contents of the notes (cf. Figure 1, indicator at the lower right-hand corner). Thus the amount of the saves can be seen also as part of the collaboration.

	Distributed	Local	Open Univ
Number of pairs	17	4	7
Average number of openings/student	3,09	8,38	8,21
Average number of closings/student	1,41	6,25	4,79
Average number of savings/student	0,35	0,86	2,36
Average number of looking the pairs' notes/student	0,9	4,75	3,36
Percentage of students who did not use the tool at all	23,5%	37,5%	25%

Table 2. The use of the note-taking tool on the three courses

In Table 2 we concentrate on the pair work, so we have excluded those students from it who had to work alone. There are a few small figures in Table 2, because of the fact that in all groups there were quite many students who did not use the tool at all. However, they have been included into Table 2 figures to give a more comprehensive picture. Overall, the Distributed Group did not utilize the tool as much as the two other groups. One reason for this might be that for them both the Web-conferencing and the partner was a new acquaintance. The two other groups were more "local" and more experienced in Web-conferencing. In an unfamiliar and new situation, a learner might rely more on communication methods that one is familiar with, say, on e-mail and

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telephones. It takes a lot of energy to start using a rather new facility in a situation where also other tasks are resource demanding, e.g. the moderating and preparing for the seminar talk. Finally, the Distributed Group consisted of pairs where one member was typically older than the other, so the age-difference might have had an influence.

A closer look at the data shows that in the Local Group there was one student who used the tool very much and in a group as small as this (only 8 students) it will give a rather distorted outcome. This leaves the Open University Group having the most use for the tool. This might be a consequence of a closely-knit group or from the fact that they also had suggested most topics of their own. These might have motivated them to take care of the discussions more (see Table 1).

Considering the log data from the point of view of the task itself, we can say that students used the note tool almost only for moderating the ongoing discussion (Phase II). They made some notes, discussed with their partner about distribution of work and new ideas and so on. It seems that these students liked to use the tools, which are available at the same place with their ongoing work. This might also explain why students did not use the tool in Phases I and III. In Phase I the discussion hasn't yet started, so they are preparing their initial contribution with other tools. In Phase III, the discussion has come to an end, so they might have preferred here also other text processing facilities to make conclusions of the moderated discussion. The contributions of Phases I and III are also different from those of Phase II in that that they are typically longer and might need more time to prepare.

As for the "modes" of using the tool, our students found the tool most useful in supporting individual work (Mode A). In every group there was at least one pair who employed the tool for asynchronous collaboration (Mode B), the Open University Group leading also in this. However, the log data shows that no pair used it "semi-synchronously" (Mode C). One reason for this might be that our current conferencing system did not support awareness about co-learners, which in fact made it impossible for a student to know whether his/her pair is inside the system at the same time. A facility of this kind would be essential in semi-synchronous collaboration.

Opinions of the students

In all three groups about a quarter of the students did not use the tool at all (see Table 2). In the questionnaire most common of their explanations was that "I did not remember that there was such a tool". A few said "I prefer the e-mail" or "I rather do my notes using the text editor on my computer". It seems these students employed the conferencing system from their own computer at home. So they did not have actually any use for notes within the system because they used the same computer all the time. One student brought up an interesting issue - the issue of privacy: "I did not use the tool, because I wanted privacy into my communication with my pair. The teachers are able to read our notes if made using the tool". This is something the teachers should consider when teaching online. The supervising and monitoring of each student should also be visible for the student. In this way, students can themselves see, how the teacher monitors their actions and it hopefully helps them to trust the system.

Those who had employed the tool brought up similar issues that we had envisioned earlier in this paper. E.g. "I used it as a scrap board where I had several bits and parts which I used later on in my contributions" (Mode A of utilizing the tool). A few of those who had preferred the tool said that their partner's unwillingness bothered them: "I myself did not use it to anything else than having a peek at my partner's texts. He did not write anything", or "... I could have used it to give messages of my plans, so that we did not have to use the e-mail all the time". This supports our view that the students should have many tools at their disposal for successful collaboration. Indeed, they don't have to use all of these tools, but they are given an opportunity to choose those tools, which are most appropriate for their needs.

Concluding remarks

Our data seems to suggest that on-campus students used the collaboration tool more than those off-campus. We think this has to do with the nature of collaboration: it is beneficial if you "know your partner", i.e. you have seen your collaborator at least at the beginning of the course. Indeed, our tool was used most in the Open University group, who had been together on other courses, and had better familiarity of their fellow

students.

Several students reported that they find the note-taking tool sensible and used it in their private work, and would have used it collaboratively if their partner had used it. Also some students, who worked alone, mentioned this issue. So, as in all group work, certain decisions and compromises are made. In our case, it seemed that most of our students a tool (telephone, e-mail) more familiar to them.

This study raises improvement ideas that we will be implementing into the next version of the note tool. We believe that it would help the collaboration if one were able to know whether his/her partner is online at the very same time. We think that there should be "pair awareness" indicators in the system along the lines of Koivunen (2002) to support the collaborative moderating process. This could benefit especially the users of the note tool when they work in the semi-synchronous fashion (mode C).

In some situations learners' virtual communication is a must, and at least in those situations in our opinion it is good for the learners to have options in their virtual collaboration. However, as our study shows, older and "safer" options are often utilized whenever possible, and there are also other, equally important ingredients in good collaboration than technology. By this we mean group-forming, preferences of the members of the pair and so on. According to our study, these issues seem to influence equally or more to the success of group work than the computer tools.

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